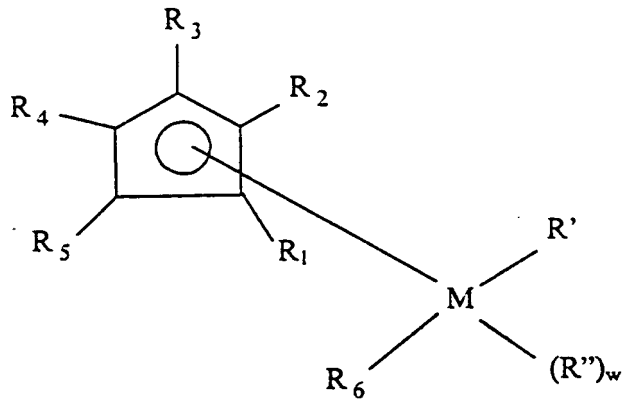
CLAIMS

1. A process for the hydrogenation of olefin double bonds present in polymers and copolymers of conjugated dienes, which comprises putting said polymer or copolymer of conjugated dienes in contact with hydrogen, in an inert solvent and in the presence of a catalytic system, characterized in that said catalytic system essentially consists of one or more titanium compounds selected from those having general formula (I)



(I)

wherein:

M is selected from Ti(III) and Ti(IV) and relative mixtures;

R" is selected from (i) an organic or inorganic radical of an anionic nature, different from cyclopentadienyl or cyclopentadienyl substituted, (ii) an oligomeric group having general formula (II);

the groups R_1, R_2, R_3, R_4, R_5, each independently represent atoms or radicals linked to the cyclopentadienyl group co-

ordinated to the metal M, and are selected from hydrogen and any other suitable organic or inorganic substituent of said cyclopentadienyl group;

R_6 is selected from: (a) an inorganic anion, (b) a hydrocarbyl group having from 1 to 20carbon atoms, (c) R';

"w" has the value of 0 or 1, according to the valence of Titanium;

R' consists of an oligomeric group having the following formula (II):

$$-(A_x D_y U_z) R^I \qquad (II)$$

wherein:

A represents any monomeric unit deriving from a vinylaromatic group polymerizable by means of anionic polymerization, having from 6 to 20 carbon atoms;

D represents any monomeric unit deriving from a conjugated diolefin polymerizable by means of anionic polymerization, having from 4 to 20 carbon atoms;

U represents any generic optional monomeric unit deriving from an unsaturated compound co-polymerizable with any of the above-mentioned conjugated diolefins D or vinylaromatic compounds A;

R^I represents a hydrocarbyl group having from 1 to 20 carbon atoms,

any index "x" and "y" can be independently zero or an integer, provided the sum (x+y) is equal to or higher than 2,

preferably between 2 and 50, more preferably between 2 and 25;

"z" can be zero or an integer between 1 and 20.

2. The process according to claim 1, wherein the hydrocarbyl group (b) of R_6 is selected from cyclopentadiene and cyclopentadiene substituted.

3. The process according to claim 1, wherein the D-type monomeric units in formula (II) derive from 1,3 diolefins having from 4 to 20 carbon atoms.

4. The process according to claim 3, wherein said 1,3 diolefin is selected from 1,3-butadiene, isoprene, 1,3-pentadiene, 2-methyl-1,3-pentadiene, 1,3-hexadiene.

5. The process according to claim 4, wherein the 1,3-diolefin is selected from 1,3-butadiene and isoprene.

6. The process according to claim 1, wherein the monomeric units of the A-type in formula (II) are vinylaromatic compounds selected from styrene, α-methylstyrene, p-methylstyrene, vinyl naphthalene.

7. The process according to claim 6, wherein the vinylaromatic compound is styrene.

8. The process according to claim 1, wherein the sum (x+y) ranges from 2 to 50.

9. The process according to claim 1, wherein "z" in formula (II) is equal to zero.

10. The process according to claim 1, wherein "x" and "z"

in formula (II) are both zero and the group R' consists of an oligomer of the conjugated diene D having an average polymerization degree ranging from 2 to 15.

11. The process according to claim 1, wherein the group R^I in formula (II) represents an aliphatic, cycloaliphatic aromatic or alkyl aromatic group having from 2 to 10 carbons atoms.

12. The process according to claim 11, wherein R^I is selected from tert-butyl, n-butyl, isopropyl.

13. The process according to claim 1, wherein U is selected from acrylic and methacrylic esters.

14. The process according to claim 1, wherein the compound having general formula (I) is selected from:

- $Cp_2Ti\ [(C_5H_8)_2C_4H_9]$
- $Cp^*Ti\ [(C_5H_8)_2C_4H_9]_3$
- $Cp_2Ti\ [(C_5H_8)_5C_4H_9]$
- $Cp_2Ti\ [(C_8H_8)_5C_4H_9]$
- $Cp_2Ti\ [(C_4H_6)_5C_4H_9]$

15. The process according to claim 1, characterized in that is carried out at a temperature ranging from 20°C to 200°C and a pressure of 1 to 50 bar.

16. The process according to claim 15, wherein the temperature ranges from 70°C to 160°C.

17. The process according to claim 1, wherein the catalyst having general formula (I) is present in quantities ranging

from 50 to 150 ppm of titanium with respect to the (co)polymer to be hydrogenated.

18. The process according to claim 1, wherein the inert solvent contains a protic impurity scavenger in a maximum quantity of 1 mmole/l.

19. The process according to claim 18, wherein the scavenger is selected from aluminum alkyls.

20. The process according to claim 19, wherein the scavenger is $Al(i\text{-}C_4H_9)_3$.

21. The process according to claim 1, wherein the polymers of conjugated dienes are selected from polymers of 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene, 1,3-pentadiene, 2-methyl-1,3-pentadiene, 1,3-hexadiene, 4,5-diethyl-1,3-octadiene and 3-butyl-1,3-octadiene.

22. The process according to claim 21, wherein the conjugated dienes are selected from 1,3-butadiene and isoprene.

23. The process according to claim 1, wherein the copolymers of conjugated dienes are selected from copolymers between conjugated dienes and vinyl arenes.

24. The process according to claim 23, wherein the vinyl arene is styrene.

25. The process according to claim 23, wherein the copolymers of conjugated dienes are selected from styrene - isoprene - styrene (SIS) and styrene - butadiene - styrene (SBS) rubbers.